

Tracts 1831. (1)

With the Compliments of the Author.

—ON THE—  
**Poisonous Properties of Quinine,**

—BY—

WILLIAM O. BALDWIN, M. D.,

—OF—

*MONTGOMERY, ALA.*

WITH REMARKS BY J. MARION SIMS, M. D.

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# ON THE POISONOUS PROPERTIES OF QUININE.

BY

WILLIAM O. BALDWIN, M. D.,

Of Montgomery Ala.,

WITH REMARKS BY

J. MARION SIMS, M. D.

During the meeting of the American Medical Association, held in New York, in June, 1880, I had frequent conversations with many of my professional brethren on the dangers of quinine in enormous doses, as prescribed at the present time. I related my experience with it in former years, and referred to an article published by me in the *American Journal of Medical Sciences* in 1847, on the "Poisonous Properties of Quinine." As nearly two generations have passed since I wrote on the subject, my views seemed to be wholly new to my hearers. And I was requested by some, in whose judgment I have confidence, to publish as much of my experience as would elucidate the subject.

Quinine was at that day literally *the fashion* with Southern doctors, and one which grew to a fearful extent. We claimed for it special merit only in the treatment of malarial fevers, and such other diseases as were intermittent or remittent in their character, or supposed to depend upon malarial poison. The physicians of the South, as well as those living in malarial districts of some portions of Europe, especially in France, ran into great excesses, giving it in enormous quantities. For this excessive dosing we were frequently reprimanded by our Northern brothers in the medical press of that day, they claiming that from one to two grains given every hour or two, until eight to twelve grains had been administered, would ordinarily arrest an attack of intermittent or remittent fever in a few days; whilst the most common and ordinary doses of the Southern physicians were from six to eight grains, repeated every three or four hours, until eighteen, twenty-four or thirty-six grains, and sometimes a much larger quantity had been given within twenty-

four hours. The Northern physicians, who were then so conservative in their use of quinine, have now not only far exceeded us in the quantity used in a given period but have extended its application to other diseases, until it is now almost a universal remedy with many of them. Under the specious term of "*anti-pyretic*" it is used in all kinds of phlegmasiæ, and even to control arterial action in diseases which are not always supposed to depend upon malaria. Even in inflammatory reactions, which may be apprehended after surgical operations, many commence its administration without waiting for the pyrexia to supervene; whilst others, led by the late Dr. Easly, of Little Rock, and Dr. Hunter McGuire, of Richmond, take time by the fore-lock and commence with large doses a day or two before performing the operation, in order, as they say, to "prepare the system."

The use of quinine as an anti-pyretic is by no means original with its present advocates. The first publication that I know of in which this view of its action was insisted upon appeared in the *American Journal of Medical Sciences*, July, 1844, from the pen of the late Dr. W. M. Boling, of Montgomery. He did not call it *anti-pyretic*, however (for the word has been coined since then), but used the equally expressive terms, "*anti-phlogistic*," "*contra-stimulant*," and "*sedative*," restricting its use in this way to the "inflammatory diseases of malarious districts"—especially to the winter pneumonias occurring in persons whose systems had been poisoned with malaria during the preceding autumn. After the publication of Dr. Boling's paper this practice became quite popular in the South, and I adopted it myself to a cer-

tain degree. Within the last twenty years, however, the practice has to a large extent been abandoned amongst us, and I have had occasion to materially modify my own views relative to its action as an anti-pyretic or anti-phlogistic remedy. I am quite sure that I have seen some cases of pneumonia prove fatal under the operation of large doses of this remedy, which I believe would otherwise have recovered. In such cases I have known it to produce continued restlessness, with a profound state of insomnia, attended with mental delusions, finally resulting in a condition much resembling that of *delirium tremens*, and ending at last in death, after the grave symptoms of pneumonia had entirely disappeared.

Quinine is unquestionably at times a powerful nervine irritant. I have often had occasion to deplore its effects upon the brain, especially in infants and young children when, after several days of persistent use, it had completely upset the nervous system, producing great wakefulness, restlessness, and fright, with an alarming sense of falling, ending sometimes in convulsions and even in death. I have become so cautious in the use of this remedy of late years that I have had no occasion to witness its poisonous effects in my own practice, but, in consultations, I have had opportunities of confirming the views which I have so long entertained as to its immediate and direct agency in producing the effects which I have ascribed to it.

I am under the impression that the revival of its use in the large doses in which it was given at the South thirty or forty years ago is doing a great deal of mischief throughout the country, and especially in some of our larger cities, and that it is often the cause of fatal injury when its agency is not suspected.

The first case that led me to suspect that quinine was capable of producing poisonous effects occurred in my own household. A man servant, colored, thirty years old, had an attack of acute pneumonia of the right lung, on the 25th of October, 1845, whilst I was temporarily absent from home. He was attended by a professional friend, who made copious notes of the case, from which I gather that the pneumonia was at no time of a violent character. The patient commenced taking quinine at five o'clock P. M.

on the 27th and continued it until 1.30 o'clock P. M. on the 28th, during which time he took sixty-eight grains. At three P. M. (one and a half hours after the last dose of quinine) the doctor was called in haste, and his notes at this visit I here give in full: "28th, 3 o'clock P. M. Called to patient. He had a little while before been taken with a *jerking motion* of the whole body, which lasted several minutes, and immediately after his *vision was so imperfect* that he could scarcely distinguish anything. Found whole surface hot; respiration irregular, from 11 to 20; pulse 100, full and rather firm; temporal veins turgid and temporal artery throbbing; great *restlessness*, anxiety and alarm; thirst increased, tongue more dry; *pupils dilated*; he dozes two or three minutes at a time, then starts up, breathing more quickly and audibly; cough frequent and dry; respiratory murmur heard over greater extent of whole lung. The convulsive movements of body come on every ten or twelve minutes, sometimes apparently of whole body, at others confined to the arms. He was not insensible during the convulsions, nor was there foaming at the mouth, but occasionally a staring and vacant look and rolling up of the eyes. By half after four o'clock he was *completely blind*.

\* \* \* \* \*

It is unnecessary to pursue the subsequent details of the case. His vision began to improve in about twenty-four hours, but it was never fully restored while I kept oversight of him, which was about twenty years.

The agency of the quinine here, in producing *blindness, convulsions, etc.*, is certainly most manifest. It was commenced at five o'clock on the evening of the 27th and continued until 1.30 o'clock P. M. of the 28th, being twenty hours and a half from the first dose to the last, during which time sixty-eight grains were introduced into the system, the pernicious influence of which was visible at three o'clock, one hour and a half from the last dose. The *restlessness, tremors, slow and irregular breathing, dilatation of the pupils, blindness and convulsions*, all supervening at the time they did, bespeak most pointedly and conclusively the poisonous operation of the quinine.

The next case that led me to think that



quinine was capable of producing poisonous effects was one in which convulsions, blindness and death followed its use, when I supposed my patient to be convalescent. This was an attack of tertian remittent fever, which occurred in July, 1846, in a negro girl, aged six years, living in a swampy and malarious district of country about five miles from this city. The paroxysms came on early in the morning, and declined during the latter part of the succeeding day. I saw her on the fifth day of her disease, and during the early part of her third paroxysm of fever. Her bowels had been evacuated and she had taken moderate doses of quinine during her last remission of fever. On the days of the exacerbations of fever her pulse rose to 160, and during the remissions fell to 120. Within the first twenty-four hours after seeing her I gave her two grains of quinine, at intervals of two hours, until ten grains had been given, and repeated the same doses at intervals of four hours until a like quantity had been taken, making twenty grains within forty-eight hours. At my visit on the third day of my attendance I found that the exacerbation of fever had not come on, though she was suffering with *extreme restlessness*, from what I supposed to be a high state of *quininism*, but almost free from fever. I therefore determined to withdraw the remedy, and gave directions to that effect. On returning next morning I found, to my great surprise, that my patient was dead, and the nurse, who is very intelligent, gave me the following account of her. Soon after I left on the previous day he found her "in a free, warm and general perspiration, which lasted three or four hours." On discovering this he concluded she was in a fine condition for taking quinine, and gave her *four* grains, and repeated the dose three hours after, making twenty-eight grains in all, during a period of something less than two days and a half. Shortly after he gave her the last dose her skin became dry, succeeded by increased restlessness. About six o'clock she had a convulsion. After this he noticed that the *pupils of her eyes were dilated*, and soon discovered she was *totally blind*. When asked if she knew her mother and other persons who were placed before her in a bright light, during the intervals of her convulsions, she

would roll her eyes about—apparently endeavoring to fix them on some object—and then she would say, "I can't see them." The *dilatation of the pupils, blindness, restlessness, convulsions, etc.*, continued until eight o'clock, when she died. I was not prepared for this result, and therefore could not make a thorough post-mortem examination, my patient being five miles from the city. Consequently, I made a partial one only of the stomach and bowels. Considerable vascularity was found in portions of the small intestines and stomach, the former containing secretions of a yellowish and greenish substance intimately blended with mucus—no worms. Pupils enormously dilated.

A review of this case left no doubt upon my mind of the direct agency of the quinine in producing death. The quantity given immediately before death (eight grains) would not of itself have produced the fatal result, separate from the agency of that which had been given previously, but at the time these last portions were given it must be remembered that the system was still charged with quinine to the extent of cinchonism, for up to four o'clock that morning it had been regularly introduced into the stomach, at intervals, for nearly two days. The accession of fever, which should have taken place on the day before, was prevented. Now it is very sure that the patient either died from the effects of the quinine, or that the paroxysm of fever, which had been arrested or suspended, supervened on the day of her death and killed her. The latter could not have been the case, for we find her an hour or two before she commenced taking the quinine (the last time) in a warm, free and diffused perspiration, and evidently cinchonized. The most conclusive evidence, however, to my mind, that the quinine killed the patient, is the characteristic train of symptoms which immediately followed its administration and preceded death, viz.: *The extreme restlessness, dilatation of pupils, blindness and convulsions.*

In other accidents of the kind which have been reported by authors, the symptoms do not differ in any prominent particular. The reader is especially referred to the perusal of an article in the twenty-sixth volume of the *Dictionnaire de Médecine*, on *Quinquina*, by

Guersent, where several cases of the kind are recorded as having occurred under the observation of M. Trousseau, Dr. Gaicometti and others.

These two cases occurred within twelve months of each other. The first and elder recovered with permanently impaired vision. The second and younger, unable to resist the power of the poison, quickly died. The symptoms of poisoning in the two were identical. The first case excited a suspicion in my mind that the anomalous symptoms were due to the poisonous properties of the quinine. And when the second case occurred, and was followed by death, my suspicions were merged into a conviction that quinine, in large and repeated doses, was capable of producing dangerous results.

For the purpose, then, of determining as precisely as possible the toxicological effects of the sulphate of quinine, I undertook and performed numerous experiments on dogs during the summer and autumn of 1846. I began these experiments soon after the death of the six-year-old patient, for I was anxious to settle the question at once.

By way of anticipating, or forestalling any objections which may be made to these experiments, as illustrative or typical of the effects of the same substance upon the constitution of man, it would be well to premise them by a quotation from a very popular author on *Toxicology*: "A good deal of obscurity still hangs over the relative effects of poisons on man and the lower order of animals. There are two species, however, whose mode of life in respect to food closely resembles our own, and which, according to innumerable experiments by Orfila, are affected by almost *all poisons exactly in the same way as ourselves*, namely, the cat and the dog, *particularly the latter*." And, after going on to mention some difference in the action of certain substances, the same author observes again: "Yet the differences alluded to are probably not greater than exist between *man and man* in regard to the same substances; and, therefore, it may be assumed that, on the whole, the effects of poisons on man differ little from those produced on the dog and cat."—Sir Robert Christison on Poisons, p. 63.

A comparison of the poisonous effects of quinine, as exhibited in the two preceding

cases and in the following experiments, I can but think, will go far towards proving that the toxical effects, of *this substance*, upon the constitution of man and that of the dog do not differ materially.

These experiments were performed in the presence of different members of the profession, and for valuable aid and assistance I am especially indebted to the kindness of Drs. Boling and McLester, and of Dr. Marion Sims, then of Montgomery. I will not impose upon the reader a minute detail of each experiment, but will endeavor to condense the general results as concisely as possible.

**SYMPTOMS WHICH FOLLOWED THE INGESTION OF LARGE DOSES OF QUININE INTO THE STOMACHS OF DOGS.**—*Restlessness* generally preceded all other symptoms, as was indicated by the animal changing its position often and constantly moving from place to place.

*Vomiting*, or, in those cases where the esophagus was tied, efforts to vomit, succeeded. *Purging* was noticed occasionally, but in no instance except where the medicine was taken by the stomach. Then came on *muscular agitation* or *tremulous movements* of the body and extremities, with a *constant motion of the head*, resembling somewhat *paralysis agitans*. In attempting to walk the dog would totter from side to side and fall, or, if he maintained his feet, would walk in a direction different from the one which he seemed to desire. When under the full operation of the poison, the power of locomotion, or even the power of standing was lost altogether, the extremities being *completely paralyzed*. This state was accompanied with more or less *excitement of the vascular system*; the pulse increasing in frequency and rising from 110 to 160, and in one instance even as high as 240 per minute, as nearly as it could be counted. *Great oppression of breathing* was present, and sometimes *frothing at the mouth*. The *dyspnoea* in all instances was excessive, sometimes panting, at others *slow and labored*, resembling in a most striking manner an acute attack of asthma; countenance expressive of great distress and anxiety. The *pupils of the eyes were invariably dilated*, and generally to an enormous extent, leaving but a small ring of the iris perceptible, and *vision*, as well as

could be judged, *was entirely lost*. *Convulsions* were observed in every case (except one), which was watched to its termination, where the dose given was sufficient to produce death, and in one or two instances where the medicine failed to produce this result. *Furious delirium* was present in one case, as was manifested by the dog barking and biting at everything about him. Sometimes a *profound coma* would ensue, accompanied with slight *muscular agitation*, *slow* and *heavy* breathing, terminating in death in a very few minutes after the poison had been taken. In a few instances the subject seemed as if stunned by a sudden and powerful blow or violent fit of apoplexy. This latter effect, however, was only observed when it was given to young dogs (half-grown and under) through the jugular vein or peritoneum. Its effects upon puppies seemed to be *proportionately* much greater than upon dogs fully grown.

The time required to produce death varied with the quantity given and the age of the subject, as well as the mode and manner of its administration. In some instances it varied considerably when the dose, mode, and all other circumstances of its administration were supposed to be equal. Sometimes fifteen or twenty grains produced the uniform and peculiar train of toxical symptoms, succeeded by death in a very short time. Again it required these quantities doubled and repeated until 120 grains had been taken to produce the same results. This fact is in accordance with my experience relative to its remedial action upon the human subject, showing that it is governed more, perhaps, in its *modus operandi* by inherent idiosyncrasies. It always affects the young, whether human or animal, more powerfully than the mature being. The modes of giving it adopted were by the stomach, the peritoneal cavity, and by the jugular vein. When given by the stomach it produced vomiting, and was rejected generally before a sufficient amount to produce death could be absorbed. By dissolving and largely diluting it with water a sufficient quantity was absorbed to produce death, in this manner, in one instance. In almost all of the experiments with it by the stomach, however, the oesophagus was ligatured. When dissolved and

given by the *stomach* its first effects were observable in about twenty minutes, sometimes shorter or longer, and death resulted in from one to thirty-six hours, usually in four or six. An empty stomach facilitated its operation greatly. When injected into the *peritoneum* in full doses (forty grains) its effects were appreciable in from four to six minutes, and death occurred in from thirteen to thirty minutes. When injected into the *jugular vein* (in giving it by this mode great care was taken to prevent the admission of air) its first effects were manifest in a space of time so short as to be almost inappreciable; not more than a few minutes after the nozzle of the syringe was withdrawn, and death occurred in one or two minutes after the first symptoms of poisoning were observed. In all instances, except one, the quinine was dissolved in water by the addition of sulphuric or other acid in quantities barely sufficient for this purpose.

In one instance, where it was made into a bolus and enveloped in a slice of bacon and introduced into the stomach, vomiting occurred in twenty minutes, and a large portion of the medicine was returned. Except that it did not produce death, its effects did not differ from those observed in other instances, where it was dissolved and given by the stomach.

When the experiments went far enough to produce amaurosis, short of death, the vision was regained after a time. In one instance the dog remained *totally blind* for two weeks, and afterwards regained his vision slowly. This is also a feature in the first case reported in the commencement of this article. The man regained a useful but imperfect degree of vision in a short time. From these, as well as other cases of the kind reported, it would seem that amaurosis from this cause is not likely to result in total and permanent blindness. However, I have met with one case in which the vision was never restored. It has been over twenty-five years since the occurrence, and the patient is still alive and in good health, but unable to distinguish persons or to read the largest print.

Though quinine operated much more promptly when injected into a vein or the peritoneum, yet I did not observe that it operated with more power or force; that is, I



did not discover that a given quantity administered in this way would produce death more certainly than when given on an *empty* stomach. Twenty-eight grains injected into the cavity of the abdomen in one instance, and twenty grains injected into the jugular vein in another, failed to produce death, yet these quantities produced death when given by the *stomach*.

The *post-mortem* appearances were equally uniform with the symptoms before death. The most prominent and characteristic appearances were the *dark, fluid and defibrinated* condition of the *blood*, and the *congested* state of the parenchyma of the *lungs*, resembling very much red hepatization. The vessels of the membranes of the brain were engorged, so also were the liver and kidneys in some instances. The mucous membrane of the stomach and bowels were vascular, and highly injected in patches. The membranes of the spinal cord were more or less vascular, and, in one instance, a semi-fluid coagulum of blood was found in the upper half of the theca vertebralis. This was probably owing to the subject being very young, and the convulsions being much more violent and frequent than in any other instance.

These experiments prove clearly that quinine is a *poison*, and one which may be made *directly fatal to life*. The symptoms which its exhibition gave rise to in the dog are almost identically the same as those observed in the human subject, where poisoning from this substance is known to have been produced. Indeed, there is not a symptom noticed in these experiments which has not, at one time or other, been observed in the cinchona-poisoned human subject. The two cases of quinine poisoning reported in the commencement of this article, exhibited symptoms identical with those observed in the dog, and my experiments establish the fact that the manifestations of its *poisonous operation* upon the dog are identical with those observed in the human subject, or, at any rate, do not differ more than they do in different instances on man and man.

Its operation as a poison, as well as a remedy, is certainly peculiar, and it seems difficult to assign it to any particular class of poisons, differing in some respects from all of them. It appears to resemble in its ac-

tion, more closely than any other, those of the "*second class*" of Orfila, or the class of "*narcotic poisons*." It does not seem to possess any hypnotic properties; in this it differs from most of the substances included under this head. I do not mean to touch the much agitated question of the mode of its remedial operation, but desire to speak of its poisonous action only, and on this head will only add, further, that its operation seems to be principally upon the nervous system, as is demonstrated in the derangement of the senses of vision and hearing, and of the respiratory functions; also in the general muscular agitation, convulsions, etc. As it has been detected in the urine there can be no doubt that it enters and mixes with the blood, and through this means exerts a *direct* influence upon the nervous system.

In a practice of nearly forty years in the South, the greater part of that time I have employed the sulphate of quinine as a principal remedial agent, not only in malarial fevers but in our other endemic diseases. Accustomed as I have been to witness the most satisfactory results from its exhibition, and familiarized as I *thought* I was with the minutest impression which it was capable of making on the animal economy, I was prepared to believe every report in its favor, and had almost fallen into what I fear is becoming now a popular error, that "if it does no good it will do no harm." I say this much, by way of showing that I entertained no prejudice against it as a remedy, or even willingness that it should be found to possess poisonous properties, which might tend somewhat to circumscribe its useful application. On the contrary, I entertained a fondness for it not equalled by my partiality for any other remedy. Occasionally my enthusiasm in regard to its virtues would be somewhat abated, and my confidence in its innocuousness would be somewhat shaken when it failed to produce the results anticipated. Sometimes unlooked for symptoms would be developed under its influence; but soon further experience would restore my former admiration of its sanative powers, and dispel all fear of the probability of its having excited an injurious influence. Its occasional failure to meet the indications which it was designed to fulfill was attributed to negli-



gence in its administration, and the unlooked for symptoms which sometimes occurred under its operation were generally regarded as anomalous manifestations of the disease itself. Notwithstanding this acknowledged partiality for it I have never administered it in the enormous doses prescribed by those who boast of having given their thirty grains, repeated every half-hour, until 240 grains were introduced into the system, or their several ounces in the treatment of a case of fever. I have very rarely given more than ten grains at a single dose. My usual mode has been to give from four to six grains, and repeat at intervals of two, three, or four hours, until twenty-four or thirty six grains had been introduced into the system in adults. Occasionally I have given it in larger doses, but this has been extremely rare. The quantities specified above, given at the proper periods of intermission or remission, will accomplish ordinarily all that the remedy is capable of doing. Enormous doses, to say the least of them, are unnecessary. Sometimes, owing to want of time, I have given from twenty to twenty-four grains at once, but in such cases have never repeated this dose the same day. Second to none other, quinine must ever hold the first place in our *Materia Medica* in the treatment of malarial diseases. I am accustomed to witness its peculiar and specific influence in arresting certain forms of disease; but that it is now being used too recklessly and indiscriminately I feel fully persuaded, and that it may be directly and fatally poisonous I am entirely convinced. To show how completely the world at one time ran riot on this subject I quote the following remarks by Prof. S. Henry Dickson, in an article in the *South-eastern Journal of Medicine* (Vol. I, No. 1):—"A medical friend in Alabama assures us that he had administered thirty grains of the solution of quinine every hour for seventeen successive hours, and we have heard authentically of a western physician who emptied into the stomach of a patient laboring under bilious remittent, an *ounce bottle* of sulph. quinine in *one night*. From thirty to fifty grains are now spoken of as not unfamiliar doses; and even one hundred grains are occasionally given at once, and, we are assured, both with safety and striking success. It is

in France, however, that the largest amounts of this salt have been employed. Guersent and Raveillon speak of a Dr. Bazire as having been remarkable for his enthusiastic and exclusive confidence in quinine as a remedy for the violent and pernicious intermittents in the department in which he practiced. Madame Bazire being seized with the prevailing malarial fever, took from him in a very short space of time 240 grains (16 grammes) of sulphate of quinine. Soon after, the symptoms increasing, he gave her at one dose 375 grains (25 grammes), more than three-fourths of an ounce. At this juncture, fortunately for her, he fell sick, and the care of her devolved on other hands. He hastened to administer to himself by the mouth and by the rectum 900 grains of the sulphate of quinine (60 grammes), nearly *two ounces*, in a very short space of time; and still further took, during the space of eight or nine days, *five ounces*. He died a martyr to his reckless and explicit reliance on the drug, and she recovered imperfectly, having been for a long time both deaf and blind, the senses both of sight and hearing still remaining feeble."

How far Madame Bazire was indebted for her lucky escape to the fortunate rejection of the medicine by the stomach, or how much of the alkaloid was rendered inert by the want of a solvent, we are only left to conjecture. We are not told either how much was given by the rectum, which would render its action less powerful. This, however, seems to have been a favorite mode of giving it with Dr. Bazire, and indeed one might suppose an ordinary *stomach* scarcely capacious enough to receive his enormous doses. But, all this as it may be, we do know that other unfortunate individuals have fallen victims to infinitely smaller doses.

M. Briquet reports two fatal cases, in one of which death occurred after a "comparatively small quantity" of quinine had been taken; in the other about 100 grains *given during the space of two days*, and in another case which occurred in the practice of M. Recamier *death* occurred after the administration of near two drachms in doses of five grains repeated every hour.

In the case of death, which occurred in my practice and which is detailed at length in

the commencement of this article, it is difficult to say how much of the quinine was engaged in bringing about this result. It had been given regularly throughout two days—on the first two grains every second hour, and on the second day two grains every fourth hour, and then four grains given and repeated in three hours, nine hours after it had been suspended altogether. In this case the patient was only six years old.

\* \* \* \* \*

Quinine has doubtless often been the cause of injury and even death when its agency was not recognized, especially in the hands of those who were prepared to witness only its salutary operation.

Under the impression that quinine is a poison and one capable of producing death, when given in overdoses, and that it is frequently *prescribed* nowadays in quantities calculated to produce this result, and knowing that it is not regarded by a large portion of the profession in the same light, I have been induced to offer these observations and experiments in regard to it, not with the view or desire, however, of lessening its judicious employment, for under a proper and careful administration of it I know of no single remedy half so valuable to the practitioner of medicine as quinine, but like all other remedies capable of effecting much good, it may at the same time be made the instrument of incalculable mischief. \* \* \*

REMARKS BY DR. J. MARION SIMS.

The publication of Dr. Baldwin's paper on the Poisonous Properties of Quinine in Large Doses in 1847, served the good purpose of bringing many of us at the South to think seriously of its dangers under certain conditions. In the main we profited by his teachings, and came down to a common sense view of the subject. We stopped at once giving 60, 80 and 100 grains of quinine during the remission of fever and reduced the quantity to from 24 to 36 gr. in the 24 hours, or just enough to produce moderate cinchonism. I hope the resumé of Dr. Baldwin's valuable paper here presented may now exercise as healthful an influence on the profession at

the North as it did 35 years ago on that of the South. Dr. Baldwin was greatly aided in the revolution he effected in this direction at the South by several accidents proving positively the dangers of quinine in heroic doses. One of them I may mention: A lady aged 30, had an attack of pernicious intermittent or as we used to term it, congestive fever. She was seen by one of our most eminent physicians, a man whose contributions to medical literature stamp him as one of the ablest men the South has ever produced. He gave this lady eighty grains of quinine in a few hours. She recovered. The next day she was blind. This was 35 years ago, and the lady still lives, but the amaurosis remains just the same. The beauty, accomplishments, high social position, and wealth of this lovely woman made her case more extensively known than if she had belonged to the humble walks of life. And her case was doubtless influential in aiding Dr. Baldwin's reform movement in and about Montgomery.

A friend of mine said to me the other day, "Mrs. X. was profoundly malarialized. I gave her 160 grains of quinine in two days, and sent her off to Europe." I am sure this practice is attended with risk, and I think physicians at the North after this hobby has been ridden a while longer will as they did at the South, return to more moderate dosing.

I resided in Montgomery when Dr. Baldwin undertook his experiments on dogs as he has described. I assisted him with many of them, and I shall never forget the impression they made on my mind. I had not gone quite mad like some of my friends on giving immense doses of quinine. Still I was giving it in larger doses than I ever gave after seeing Dr. Baldwin's experiment.

I congratulate the "MEDICAL GAZETTE" on bringing this interesting subject again to the notice of the profession, and on scattering it broadcast over our great country. I am sure that the labors of my life-long friend Dr. Baldwin, will be as well appreciated now as they were when we were both young.

J. MARION SIMS.